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# Worldwide Report

ENVIRONMENTAL QUALITY

No. 271

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## KERALA PLANS PROGRAM TO CHECK EROSION

Madras THE HINDU in English 9 Aug 80 p 8

[Text] Nature has struck Kerala again with all its ferocity. The heavy rain, the resultant floods and the high tidal waves leading to sea erosion have caused great damage to property.

The sea erosion did not cost any life but the floods and other natural calamities have taken 42 lives.

The worst-hit areas are places north of Quilon district and according to rough official estimates, the losses amount to more than Rs. 33.31 crores. The State Government has sought immediate Central assistance of Rs. 28.64 crores. A Central fact-finding team is visiting Kerala to make an on-the-spot assessment of the losses suffered and to recommend aid. [as published]

Rainfall during the current south-west monsoon was rather heavy in the State except in certain regions. It was normal in Trivandrum and Quilon districts. Most of the 41 west-flowing rivers have received copious inflow and a huge quantity of the water has found its way to the sea. A concomitant problem of this discharge is the erosion of coastal areas.

Of the 560-km. coastal line of Kerala, 360-km. length of the shore zone is susceptible to severe erosion. Over the years, measures have been adopted by the Government to protect a stretch of 225 kms. Even areas where sea-walls, sea-wall groynes and groynes have been constructed are subjected to erosion later, and during the current season, a length of 18 kms. of such 'protected areas' have become 'unprotected'.

A special feature noticed is the adjacent reaches of the protected areas are becoming highly vulnerable in the successive years.

Studies made by the different agencies have shown that certain peculiar features of the Kerala coast have become beneficial as well as problematic. One such phenomenon is the formation and behaviour of the "mud bank". A boon for fishermen, this mud bank in the coastal area of

Purakkad near Alleppey periodically, brings a rich harvest of marine wealth. [as published] It has also proved harmful to the adjacent beaches, disturbing their equilibrium and causing erosion in the downcast beaches. The influence of the mud banks on the eco system itself has become a subject of study. [as published]

The erosion of coastal areas has become such a serious problem that a separate division is functioning in the State with its headquarters in Trichur. According to Mr. N. S. Moni, Regional Director of the division, all lateritic coasts attacked directly by waves and usually undermined require permanent protection by stone revetment. In Kerala, there are several areas like Varkala, Tellicherry and Cannanore which have lateritic coasts.

The sandy shores are not safe either. Records show that the shore line of Kerala has receded over a major part of the coast---particularly between Ponnani in the north and Quilon in the south during a period of about 116 years (1850-1966).

The process is continuing and according to Dr. A. Subba Rao, Minister in charge of Irrigation and Coastal Erosion Works, some old-timers could recollect the shore line being a "considerable distance away from the present line." The recession is seen to be of the order of five metres per year in Chellanam region and 80 metres at Thrikkunnapuzha area.

The erosion caused by river outlets and migrating inlets, migrating mud banks, and cyclonic storms also eats up the coastal areas. There are the man-made problems too. Instability arises from the influence of fixed shore structures like breakwaters, jetties and approach channels and removal of beach material like mineral deposits.

Experiments were conducted for the past over 90 years to see how the incursion of the sea could be curbed. The construction of groynes had been started in the Varkala Anjengo coast in Trivandrum district in 1890. It was extended to other places and the groynes have stood the test of time and waves fairly well, wherever the littoral material from upcoast sides could be trapped. Where the coast suffered from lack of littoral material supply, the construction of groynes was not found favourable.

Another experiment of constructing sea-walls and groynes in certain regions did not yield results and the system was found damaged considerably within a short period. Since 1964, instead of groynes, construction of sea-walls properly designed has been taken up.

Sea-walls involve heavy financial investment. The design followed since 1964 was changed in 1969 to withstand more effectively the onslaught of the waves. The latest approved design has a seaward design slope of one on four, launching apron with one on ten slopes and crest elevation 3.35m.

The cost of a sea-wall works out to about Rs. 45 lakhs per km. A more economic design evolved by the Coastal Erosion Studies Division is under field test. If found satisfactory, it is expected to save up to 30 per cent of the initial investment.

Certain methods like 'artificial nourishment of the beach' or growing a particular variety of grass on the shore were examined by the Government some time back. They were, however, given up as impracticable. Artificial nourishment of the beach will require heavy loads of sand being dumped on the coastal areas prone to erosion periodically. The problem is the availability of the sand itself apart from transportation in the thickly populated coastal area. The type of grass grown in the coast was also not found suitable. Hence these schemes have been practically shelved.

It is the State Government's stand that the expenditure incurred by it on coastal protection measures should be borne entirely by the Centre. It argues the question involved is one of territorial aggression. It is the nation's responsibility to protect the borders, whether the aggression comes from human elements or natural calamities. The State Government now bears the entire cost, Central assistance in the form of loan constituting two-thirds of the expenses incurred.

A five-year programme has been drawn up to protect the remaining unprotected vulnerable coast of 95 kms. It will require over Rs. 55 crores, and for the current year, only Rs. 5.25 crores has been provided for the purpose in the budget.

Hitherto coastal erosion works were mostly defensive in nature. The future plans, according to the Centre for Earth Science Studies which is evolving coastal zone management programmes, must include not only erosion prevention methods but also reclamation of land from the sea as well.

A multidisciplinary problem-oriented research programme, the coastal zone management is to create a data bank establishing continuous monitoring systems and application of the results for planning development and management of the coastal zone, covering an area of 25,000 sq. kms. The programme will consist of coastal land zone, shore zone and continental shelf zone management.

Under the coastal land zone, an area of 5,000 sq. kms. bounded by the shore line in the west and five to 10 kms. inland from the shore line would be subjected to scrutiny. The subjects for study will include geology, geomorphology, river basin analysis, reservoir sedimentation analysis, industries and transport demography and socio-economic study of coastal villages and towns, and also tourism potential.

A long strip of land running to a distance of about 750 kms. from Cape Comorin to Mangalore will be shore zone. Here also the studies will

be geological, oceanographic, sea transgression, prevention methods, beach deposits, ports and harbours with an eye on preventing erosion and also reclaiming land from the sea.

With the shore line in the east and the continental shelf margin (200 metres of depth contour) in the west, the continental shelf zone bears the impact of the activities of civilisation on land. The study is to understand the natural phenomenon in the zone and to provide guidelines for the control of the coastal zone.

To sum up, the techno-economic objectives of the coastal zone management will be prevention of coastal erosion, reclamation of land from the sea, environmental conservation of backwaters, exploration, estimation, conservation and exploitation of resources, improvement of navigation, improvement in land transport systems, desilting of river basin reservoirs and utilisation of the sediment and development of tourism and new townships.

CSO: 5000

MERCURY POLLUTION FOUND IN JAKARTA BAY

Jakarta PELITA in Indonesian 1 Jul 80 pp 1, 7

[Text] The waters in Jakarta Bay have been contaminated with heavy metal, but the pollution level is not so serious as Japan's Minamata Bay which caused Minamata disease.

This conclusion was reached during a meeting held at Jakarta City Hall Monday among the National Oceanological Institute of the Indonesian Council of the Sciences (LON-LIPI), National Atomic Energy Agency (BATAN) and the Group of Ten for Environmental Development, a non-governmental association concerned with environmental problems.

Sponsored by the governor of Jakarta, this meeting was convened to discuss problems of heavy metal pollution in Jakarta Bay which, according to the Environmental Pollution Study Group (KSPL), is nearing saturation point and which is feared to cause a second Minamata incident, unless the matter is resolved as soon as possible.

Investigation carried out by KSPL, which is a member of the aforementioned Group of Ten, revealed that the mercury level in the said waters has exceeded the limits of safety. This conclusion was based on sample water and marine products drawn from nearby Jakarta's beaches and the islands in the Thousand Archipelago.

Since 1918, Minamata Bay, situated in the western part of the Japanese archipelago, has been polluted with mercury; in the year 1956 the contamination began to cause human casualties, an incident subsequently known as Minamata disease.

During the 4-hour discussion, the participants agreed to make further intensive investigations of the waters of Jakarta Bay in order to find out definitively whether the pollution of heavy metal has begun to endanger human health.

The Jakarta Special Municipality has begun taking protective measures, such as monitoring sources of heavy metal contamination and planning joint

investigations with other departments and agencies of the municipality, higher institutions and the Group of Ten.

According to Dr Meizar B. Syafai of this group, a tiny quantity of mercury in a human body, particularly children's, would be sufficient to cause long-term adverse effects in the form of mental retardation.

Emil Salim, the minister of state for the Observation on Environmental Development, confirmed in a recent public lecture in Jakarta that the waters in Jakarta Bay have been polluted with heavy metal, but its damage to marine life, including fish living there, has not been ascertained.

9300

CSO: 5000

GAINS MADE IN CONTROL OF BEIJING INDUSTRIAL POLLUTION

Beijing Steel Mill

Beijing BEIJING RIBAO in Chinese 23 Jul 80 p 1

[Article: "Basically No More Black Smoke From the Beijing Steel Mill's Chimneys"]

[Text] The Beijing Steel Mill has broken away from the mistaken concept that "if the chimneys do not bellow smoke and the machines do not make a thundering noise, there is no prosperous production." A great determination has begun to exert a lot of energy to adopt measures to treat pollution at its source. Preliminary results have been observed in the half year since the program was launched.

The Beijing Steel Mill is the biggest metallurgical enterprise on Sanhuai Road in the city. In the process of steel refining, a gigantic quantity of harmful smoke and dust is emitted from the rooftop of the factory. A massive cloud of dust and yellow smoke can be seen 1 li away; there also has been the noise of the machinery. The surrounding inhabitants have repeatedly written letters of protest demanding control and treatment. As the condition [general condition of the country] develops, and especially since the four-point proposal was initiated by the Central Committee Secretariat, the awareness of the leaders of that plant has somewhat improved and a measure of conscientious action to control pollution has begun. In the period of half a year, they have worked primarily on the following three matters:

(1) An extended party committee conference and a congress of delegates of all the workers have been called separately to unify thoughts, to improve understanding, and to formulate a plan to realize preliminary changes in 1 year, minor changes in 2 years, and major changes in treatment and control in 6 years.

(2) The leaders are to be organized and strengthened to establish substantial environmental protection rules. An environmental protection leadership team has been established in the plant--with the party committee secretary as the chief and two vice presidents of the plant and one deputy

chief engineer as deputy chiefs--to implement the system of environmental pollution control and administration. On the basis of implementing many technical measures, several regulations to beautify the appearance of the entire plant and a system of monitoring and awarding prizes and assessing penalties in connection with discharging smoke and gases from the furnaces and kilns have been established. The work of pollution control and treatment has thus been accelerated. To date, the more than 10 chimneys in the rolling, pressing, forging, and extracting shops are basically no longer emitting black smoke.

(3) Strict control is practiced wherever conditions are available. Wherever conditions do not exist, they are to be created on an urgent basis. One electrical furnace machine shop had been having a serious pollution problem. After it was required to implement the four-point proposal of the central Secretariat, it installed dust elimination equipment, which removes up to 70 percent of the dust. Every day, 400 jin of flour-like fine dust are kept out of the atmosphere. The Beijing Steel Mill is determined not to become slack in this matter. It is determined to contribute to the protection of the environment of the capital city.

#### Jianhua Steel Mill

Beijing BEIJING RIBAO in Chinese 23 Jul 80 p 1

[Text] The Jianhua Steel Mill, which seriously pollutes and disturbs the people, is soon to stop production and be moved.

The caterpillars for tractors produced by the Jianhua Steel Mill are highly profitable. These are the mainstay products of the plant, but the plant is located in an urban area. The electrical furnaces create the pollution problem of smoke, dust, and noise. In order to resolve the problem of pollution and disturbances to the people, the leaders were considering stopping production and moving that plant as early as 1968. After taking into consideration the high sale and profit level of the products, however, some comrades were not able to make up their minds. After the Central Committee Secretariat's four-point proposal was made public, the awareness of the bureau and the plant was improved and they made up their minds. On the one hand, the plant leaders are creating the conditions for stopping production and moving the plant. On the other hand, the workers are told to complete their final workshift well before stopping production to fulfill the production quota every month. At present, the conditions for the plant to move are ripe. By the end of July, this source of pollution will no longer exist in the city.

## Copper Tubing Plant

Beijing BEIJING RIBAO in Chinese 23 Jul 80 p 1

[Text] The Beijing No 2 Copper Tubing Plant decided not to wait passively for the plant to move to another site and has adopted measures for controlling sources of pollution.

The No 2 Copper Tubing Plant is located in a residential area of a Hutong [a large compound of residential dwellings] in Beixingqiao. It is a unit that has serious noise pollution. The plant has 12 machines for pulling copper tubing; the largest of them weighs 15 tons. During working hours, the noise makes the ears vibrate and interferes with the lives of residents, whose homes are separated from the plant by only a wall. The masses have protested violently. For this reason, the higher level agency has approved a plan for the plant to be moved, but owing to objective reasons of money and manpower, the plan cannot be implemented immediately. In this situation, the plant is not passively waiting to be moved, but has voluntarily adopted measures to control the pollution.

The plant has a standing boiler with an evaporation capacity of .36 tons per hour. For a long time, the black smoke belled and the coaldust scattered to such an extent that nearby residents did not dare hang their clothing in the yard to dry. In April, the plant decided to adopt the method of automatic feeding of coal under the furnace. This new measure not only resolved the problem of black smoke but also resulted in a saving of two fifths of the coal consumption. The plant also used sound-absorbent bricks to line the walls to reduce the noise of the furnace bellows from the original 98 db to 77 db. In June and July the plant reconstructed four extraction machines to reduce the noise from 100 db to below the standard set by the state. At present, the plant is trying very hard to coordinate the hydraulic punch and end-grinding machine so as to resolve completely the noise pollution problem caused by the steam hammer.

'RIBAO' Comment

Beijing BEIJING RIBAO in Chinese 23 Jul 80 p 1

[Editorial: "Improve Understanding and Resolve Quickly"]

[Text] In recent years, the pollution and noise in the capital are growing more and more serious, causing the masses and foreign guests to be very dissatisfied. "Control pollution!" "Control noise!" These outcries have become louder and louder.

At present, however, some industries have not assigned a proper place to pollution and noise control. To delay action, they have emphasized many, many difficulties: "Low level of technology, and so nothing can be done;" "Lack of capital, so capability cannot match willingness;" "Production

responsibility tight, so production certainly cannot be disturbed;" etc. Pollution control is indeed not easily accomplished, and the problem of pollution and noise cannot be entirely resolved in a day or night. Some pollution and noise problems cannot be resolved immediately, because of limitations on technology, materials, and manpower levels. This reasoning can be understood by the masses. The problem remains: "Is it true that there is no way to resolve any of the problems?" This is not so. The facts reported today about the Beijing Jianhua Steel Mill and Beijing Steel Mill of the city's Bureau of Metallurgy indicate that if the leaders are determined to urge the masses to find ways, many problems are solvable. Most recently, the Central Committee Secretariat proposed making Beijing into a national political center, a cultural center, and a center of international exchange and bringing its environment up to the first level of beauty and cleanliness. To fulfill this requirement, enterprises that create severe pollution and disturbances to civilian life must be moved, merged, converted to produce something else, or treated and controlled. If those that should control and treat [pollution and disturbances] are not doing so, they will find it difficult to exist. It is hoped that this situation is understood by these units so that they may plan to solve the pollution and noise problems step by step, in the spirit of being responsible to the nation and the people. Problems capable of being resolved now must strictly be resolved. Problems that cannot be resolved right now should be explained to the surrounding masses, and conditions should be urgently created for their solution. Now is the time for resolution. Those who are determined are positive; those who are making decisions early are being positive early.

6168

CSO: 4065

PEOPLE'S REPUBLIC OF CHINA

INDUSTRIAL POLLUTION IN BEIJING SUBURBS MUST BE HALTED

Beijing BEIJING RIBAO in Chinese 19 Jun 80 p 1

[Article by Liu Tingzhao [0491 7200 2507]: "Pollution in Southeastern Suburbs Must Be Controlled--Survey of Environmental Pollution of Several Chemical Plants in the City's Southeastern Suburbs"]

[Text] Editor's Note: Doing a good job of controlling and treating environmental pollution is an important segment of the four-part suggestions of the office of the Secretariat of the Central Committee regarding the work policy of the city. Pollution of the three wastes is rather severe in the southeastern suburbs. It is high time that it be controlled. All related units should assume an attitude of being responsible to the party and the masses and do a substantial job of controlling and treating it. The members of communes and brigades in the polluted areas should emphasize the overall situation and urgently coordinate with the factories to do a good job of control. At present, our manpower, materials, and finances and our scientific and technological levels are still insufficient to meet the objective requirements of three-waste treatment, but if we truly take the matter seriously, join our efforts, and search for every possible way, it is certain that the three-waste pollution in the southeastern suburbs can be totally corrected step by step.

Some years ago, environmental pollution in the southeastern suburbs was extremely severe. The gaseous exhaust of the six chemical plants in that area contains many poisons, of which chlorine and sulfur dioxide are especially harmful. During one chlorine leak in April 1977, wherever it reached, leaves fell from the trees, seedlings withered, the animals refused to eat, and the chickens died. More than 260 mu of farmland was contaminated, with a reduction of several hundred thousand jin in the grain and vegetable yields, amounting to a loss of more than 26,000 yuan.

These plants also discharge a large quantity of liquid waste, causing the freshwater stream which flows through the center of Boluoying village to become an odorous sewer. The streambed is almost filled with sediment. This causes the water in the local wells to change color and taste, and it can no longer be used for drinking. The stream also flows into the Tonghui River, polluting the water at its lower reaches. Whenever the subject of pollution in the southeastern suburbs is mentioned, people feel worried and uneasy. Some say: "No way to control it."

In reality, it is not true that there is no way to control the pollution. Last year, that area completed 42 items of three-waste treatment and eliminated 87 instances of pollution. The plants established special three-waste management organizations to analyze the major reasons for the creation of pollution. Due to the 10 years of unrest, the systems and regulations are still not complete and the technical standard of the workers is low. During the work process, serious accidents have occurred. In the past there was no understanding of environmental protection, and the necessary measures were not taken to treat the three wastes, creating a lot of problems for the future. Work procedures and equipment were all backward. When there were runaways, overflows, drips, and leaks, constant plugging could not stop them all. The several accidents of chlorine leaks at the No 2 Chemical Plant were caused mostly by the negligence of the workers or by their deficient technical level. The workers have perfected the regulations and systems. The discipline and education of the workers were strengthened, as was their technical training, to prevent manmade chlorine contamination. In 1976 there were five accidents of escaping chlorine that were relatively serious, but there has been only one since the beginning of 1978. Most recently, the coking plant added an extraction device for dephenolization and biochemical dephenolization, creating two-stage treatment equipment to reduce the phenol content of the discharged liquid waste by 71 percent from the level before the treatment measures were adopted. They also constructed sewerpipes running 8 km in length to discharge the treated liquid waste into covered pipes instead of open sewers. The environment has thus been improved. The dyestuff plant improved its work procedures, and the treatment of sulfur dioxide contamination has produced outstanding effects.

Although the chemical plants in the southeastern suburbs have made some achievements in treating the three wastes, the liquid and gas they discharge still contain a great deal of harmful substances today--much more than the standards set by the state's regulations. The reporter learned in his survey that if this work is to be carried on further, the following problems must be resolved:

The concept of "emphasizing production and ignoring environmental protection" must be eliminated. A certain unit wanted to reconstruct its benzeneanhydride equipment to expand production. The higher level organization pointed out that the unit must combine its plans for expansion with technical improvements to resolve the longstanding, difficult

problems of benzeneanhydride contamination. Funds were dispensed for this purpose. Production of benzeneanhydride is increasing, but the residual benzeneanhydride gas reclamation project which the state ordered to be completed last year has still not been carried out.

All related organizations should provide material support. Every day the dyestuff plant discharges more than 8,000 tons of liquid waste containing more than 20 tons of foreign substances. The city's related departments approved waste treatment equipment for that plant as early as 1974. Owing to such difficulties as design, capital, materials, and labor force, this engineering project has not been started to this day.

Economic policy awaits further study. After the dyestuff plant installed residual acid gas treatment equipment, contamination of the air by sulfur dioxide was eliminated but the economic burden became heavier. Some comrades have felt bad about operating this equipment.

The method of treatment should be appropriate. Chemical plants have numerous ways of treating the three wastes, but the effects are not the same. Some wastes are really treasures. For example, the Beijing Chemical Plant combined 3-waste reclamation to gain more than 1.3 million yuan worth of more than 60 different chemical raw materials. Some are to be burned for good. For example, that large torch at the No 2 Chemical Plant burns up more than a ton of carbon monoxide every hour--the equivalent of 2,500 cubic meters of gas. Treatment of the three-wastes should be strictly carried out, but the method adopted should be appropriate. As much attention as possible must be given to gaining multiple benefits from a single action.

6168

CSO: 5000

POLLUTION CONTROL CONFERENCE HELD IN ZHEJIANG

Hangzhou ZHEJIANG RIBAO in Chinese 25 Jul 80 p 3

[Article: "Provincial Environmental Protection Research Workers Discuss Handling of the 'Three Wastes' of Industry"]

[Text] Adopting effective measures to substantially control the environmental pollution of the "three wastes" of industry and to protect the physical health of the people means contributing to the speedy realization of the four modernizations. This is the hope and resolution of the delegates at the recently held Provincial Environmental Protection Science Work Conference, and it is also the outcry of all segments of the province.

For several years, under the leadership of party committees at various levels, the province has constructed a number of "three waste" treatment facilities. Combining with their utilization, more than 50 scientific research and experimental projects have been launched, including more than 10 industries such as electroplating, leathermaking, papermaking, oil refining, chemical fibers, chemical fertilizer, acidmaking, agricultural drugs, fermentation industry, etc. Definite results have been obtained, including, for example, the dry method of making acid from the exhaust of the copper-refining process, the closed cycling of liquid waste of organic phosphorus agricultural drug manufacturing, middle-step treatment of liquid waste with alkaline grass pulp, studies on the residual toxicity of agricultural drugs, etc. Relatively good results have been obtained from all these studies, winning the attention and praise of related departments of the province and the nation.

On the basis of exchanging and summarizing research results and experiences, the conference emphasized discussion of the outline plan for environmental protection for the entire province in the coming 10 years and the 1985 environmental protection research plan (draft) to lay the foundation for pollution-control work over the next 5 years. Within the next 10 years, the goal is to discharge the industrial "three wastes" in accordance with the environmental standards set by the state and the locality so as basically to resolve the pollution problem.

In order to realize the aforementioned struggle objective, the delegates made a number of proposals to the related departments and expressed their hope that leaders at various levels will give sufficient attention to the problem of environmental protection and adopt effective measures to do good environmental protection work.

This conference was held in Ningbo City. The participants visited the liquid waste treatment facility at the Zhejiang Oil Refinery.

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PEOPLE'S REPUBLIC OF CHINA

CONFERENCE PLANS MORE NATURAL RESOURCES CONSERVATION ZONES

OW290345 Beijing XINHUA Domestic Service in Chinese 0711 GMT 28 Sep 80

[Excerpts] Chengdu, 28 Sep (XINHUA)--China recently mapped out a preliminary plan for establishing natural resource conservation zones. The plan calls for increasing the number of such conservation zones to more than 300 from the present 72 and expanding the total area to 9.6 million hectares from 1.71 million hectares. The plan was presented at China's first conference on establishing natural resources conservation zones held recently in Chengdu.

The conference maintained: Mankind's existence as well as social and economic prosperity have been endangered by the destruction of natural resources due to human exploitation carried out in violation of objective laws over a long period. The situation in China is even more serious. Because of its huge population, the average per capita availability of natural resources in China is comparatively lower than in the world as a whole. Damage to vegetation and soil erosion have been serious. Many wild animals and plants have become extinct or almost extinct. Damage to water and mineral resources has also been astounding. A serious imbalance exists between exploitation and utilization of resources on the one hand and the protection and management of these resources on the other.

Therefore, at the conference, many scientists and representatives strongly urged the leadership at all levels, all departments and the entire society to pay great attention to the protection of nature and to regard it as a serious task that concerns the country, the nation and future generations. They said that it is necessary to consider the conservation of natural resources as an urgent and important task for China from now on.

He Kang, vice minister in charge of the State Agricultural Commission, addressed the conference. Representatives of the Wolong and the Changbaishan natural resource conservation zones in Sichuan and Jilin Provinces reported on their respective experiences in building these conservation zones.

CSO: 5000

BRIEFS

**CHEMICAL POLLUTION CLEANUP**--The Beijing Municipal Leather and Hardware Plant has paid attention to the work of environmental protection. Treatment of liquid and gaseous wastes containing chromium has been strengthened to eliminate the source of pollution and save capital for the state. Beginning in 1976, that plant put 3-waste treatment work in its daily schedule of meetings. In the past 4 years, the treatment of chromium liquid waste, chromium gaseous waste, nickel liquid waste, acid gas, and carbon dioxide residual gas have been completed, successfully eliminating 80 percent of the sources of pollution at the plant. The electroplating shop at this plant discharges liquid and gaseous wastes every day, and they contain a large quantity of chromium. In the past, they were discharged without treatment and the environment was seriously contaminated. Later, the plant's leaders urged the workers to improve their work procedures as a start. Two automatic electroplating lines were organized. Not only was the source of cyanide contamination eliminated, but the chromium liquid waste was treated in the process as well. Later, a three-waste treatment team was created at the plant. With the help of the Beijing University of Industry the team used the ion exchange method to treat the chromium liquid waste and caused the chromium content to reach the advanced level of the country. They also created a new method of treating chromium-containing exhaust through research to eliminate the secondary contamination. In the past 4 years they have treated about 10,000 tons of chromium liquid waste to reclaim more than 1,600 kg of chromium anhydride, saving the state more than 10,000 yuan. Last year that plant was judged to be an advantaged environmental protection unit, municipality class. [Text] [Beijing BEIJING RIBAO in Chinese 17 Jul 80 p 2] 6168

**NOISE POLLUTION CONTROL**--The First Machine Shop of the Beijing Metal Structure Plant has constructed a machine to clean out the residue in the aluminum container soldering seams and has reduced the environmental noise pollution. For many years in the past that machine shop used a blow scraper to clean out the excess of the welding seam of aluminum container products. When the blow scraper is running, there is a very shrill noise which is very difficult for the workers to tolerate. The noise also prevents the masses in the neighborhood around the shop from resting. In

order to resolve the problem, the machine shop organized a team to attack it, and this team built the seam cleaning machine. According to the certification statement of a related department, when this machine is used to clean the residue instead of the blow scraper, production efficiency is four or five times higher and the noise is greatly reduced. The masses react to it relatively well. [Text] [Beijing BEIJING RIBAO in Chinese 17 Jul 80 p 2] In the past the East Central Street Coal Plant produced a very big noise in its beehive coal refining process, causing the residents of the neighborhood to be without peace and quiet day and night. Most recently, with the help of related departments, the plant added a vibration-insulating ditch all around the beehive coal machine and a noise barrier chamber in the machine shop. According to the test results in the related department after adoption of the reform measure, the noise of the machines in the production shop has been reduced from an average 93 db to 71 db. It is only 44 db in the building nearest the coal production shop. Therefore, the current state regulation standard has been reached. [Text] [Beijing BEIJING RIBAO in Chinese 17 Jul 80 p 2] 6168

ACID HANDLING--The Beijing Electrical Wire Plant 7 May Comprehensive Processing Shop has begun comprehensive utilization to control liquid acid waste contamination and has obtained visible results. The electrical wires made by that plant mainly use copper as the conductor. The copper strip roll delivered by the copper plant has a layer of copper oxide on the surface. It has to be washed with acid before it is used. The liquid waste after the acid bath contains 20-percent residual acid. In the past the liquid waste was discharged into a sewer that flows into the Tonghui River. It corroded the sewer pipe and polluted the water in the river. With the help of the leaders and other shops, this machine shop utilizes the liquid waste to produce copper sulfate, reducing the acid content of the liquid waste from 20 percent to 0.5 percent, lower than the regulation standard. A technical reform was also developed to reclaim the acid from the pipe. The pollution problem was basically resolved, and more than 160 tons of copper sulfate worth close to 300,000 yuan have been reclaimed. [Text] [Beijing BEIJING RIBAO in Chinese 17 Jul 80 p 2] 6168

BENZENE-FREE SOLVENT--In the spray paint process, the Beijing No 1 Lathe Plant workers are in daily contact with a solvent containing methylbenzene and dimethylbenzene. For the purpose of preventing benzene damage and guaranteeing the health of the workers, the plant has cooperated with related units to experiment with the production of a benzene-free solvent having low toxicity, low cost, and good membrane properties. Since this benzene-free solvent has been used, the work environment has greatly improved. The density of harmful substances in the air has stayed below the state's regulation standard. [Text] [Beijing BEIJING RIBAO in Chinese 17 Jul 80 p 2] 6168

AUTO EXHAUST POLLUTION REMEDIES--The harmful exhaust of various types of motor-driven vehicles is one of the important sources of pollution in the region of Beijing. The three-wheeled Dongfeng truck is a special source of trouble. There are one to three of these running through every major street every minute, spurring out dense smoke and causing the sky above the street to turn black. Other diesel buses, trucks, engineering vehicles, and tractors also discharge a large quantity of harmful gases every minute and every hour. For the purpose of reducing air pollution in the streets of the capital and protecting the health of the city's inhabitants, the following measures are proposed: (1) An exhaust standard for all types of vehicles should be immediately formulated, announced, and implemented. All vehicles exceeding the exhaust standard and running on the streets should pay a pollution fine. Detailed stipulations concerning the prevention of air pollution should be formulated and announced at the same time. (2) A technical reform committee should be established to improve the exhaust mechanism of diesel and other motorized vehicles, and related factories should be put in charge of the job of reconstructing all diesel and other motor vehicles in the entire city. The three-wheeled trucks may be converted to run on batteries. (3) The BJ-D30 and BJ-D31 electric trucks made by the Beijing Qinghe Machine Plant should be developed on a large scale, with the goal of using them to replace all diesel transport vehicles in the city for short-distance [hauling]. (4) Trackless streetcars should be developed with great urgency so that within the next few years, all buses in the city will gradually be replaced completely by trackless electric streetcars. [Text] [Beijing BEIJING RIBAO in Chinese 17 Jul 80 p 2] 6168

CSO: 5000

PROPOSALS TO RESTRICT POLLUTION IN SOFIA

Sofia SOFIA in Bulgarian No 8, 1980 pp 8-9

[Article by Ivaylo Kand'ov: "Before the Disaster Has Taken Place"]

[Text] The daily necessary food consumption per person is under one kilogram. Man needs about 1.5 liters of water daily and uses up about 10 cubic meters of air per day. Doing physical work, however, the needed amount of air may increase tenfold. Furthermore, whereas the purity of the food and water may be achieved with relative ease, we breathe the air as it is at the place where we work, live, or move. This is because no pipelines have been built as yet to supply us with clean air. It would be even harder (and, hopefully, we shall not reach this point!) to sell clean air...in cans.

In a previous issue we discussed the characteristic caused by the topography of our capital which brings about the so-called temperature inversions over the city. Let us recall that this phenomenon is a permanent feature of our daily life.

Everyone is familiar with the pollution sources: the thermoelectric plants, steam plants, automobiles, some production facilities, metal processing and chemical enterprises, households using coal and kerosene as fuel, etc., located on urban territory. Each such activity has its share in air pollution. Thus, the thermoelectric power plants are the main source for releasing into the air dust and sulfur dioxide, carbon monoxide, and others. This was particularly typical of the time when low caloric coal with high ash content was used as the main fuel. According to some estimates, in 1963, 8,168,000 tons of ashes were released into the air. In 1975, as the result of the conversion from solid to liquid and gas fuel, the amount was lowered to 800,000 tons, i.e., it was reduced by a factor of 10. This is the explanation for the reduced number of foggy days and of long-lasting fogs in recent years.

The decrease would have been even greater had the special program for the preservation and restoration of the natural environment in the area

of the Kremikovtsi Metallurgical Combine had not been fulfilled with a delay of several years, despite the numerous decrees passed by the Council of Ministers and the Sofia Okrug People's Council and Executive Committee. Yet, it is precisely here that any delay is inadmissible! The other particularly unpleasant admixture (coming essentially from the Kremikovtsi Metallurgical Combine and Thermoelectric Power Plant) is sulfur dioxide. Whereas the amount of ash has declined strongly with the change of fuel, due to the fact that sulfur dioxide is formed also in burning fuel oil, its content in the air some years and in some districts has remained higher than the maximum permissible concentration (PDK) for a settlement. Particularly high, alarmingly high, is the ash and sulfur dioxide content in the air over some districts in the winter season, when the smoke from households is added and when inversions are a frequent phenomenon.

The readings taken by the network of the Hygiene-Epidemiological Institute indicate that the most polluted area is the northern industrial zone of the city--the area around the railroad station and the Nadezhda, Tolstoy and Momkova Makhala residential complexes. The explanation is found both in the location of pollution sources located in that area and the fact that that part of the capital has the lowest elevation, for which reason here the temperature inversion is the deepest (i.e., the coldest).

Lesser pollution is caused by heat generating facilities with micro-elements: manganese, arsenic, nickel, cadmium, and others.

Motor vehicles are a source of pollution posing ever bigger problems in the big cities, including Sofia. Whereas powerful pollution sources (thermoelectric power plants, industrial facilities) seem to be easier to control, the stream of motor vehicles floods the city like a cloud of locusts, difficult to restrain and stop.

In Sofia the number of motor vehicles (about 200,000 currently) is growing steadily. Naturally, so does the amount of gases and admixtures released in the combustion of gasoline and kerosene. We know, for example, that 1,000 cubic meters of carbon monoxide (CO) are released per liter of fuel burned. High ethyl gasolines release lead compounds in the air. The diesel fuel used by the City Transport buses "enriches" the air with soot and carbon monoxide.

The harmfulness of all such mentioned or unmentioned admixtures is not abstract or imagined. However, reading newspaper articles on air pollution, one is surprised to discover that the focal point of the discontent is quite aside from the heart of the problem. Sometimes esthetic considerations are the only ones stressed (the chestnut trees, for example), forgetting the fact that humans are breathing spoiled air. Following are some of the consequences:

The admixtures scattered as air dust absorb that part of the ultraviolet solar radiation which is biologically active and, in fact, is most useful to man;

The ionizing system of the air is worsened: lightweight negatively charged ions which predominate in the natural environment and which are valuable components of the air we breathe are lacking;

Gradually, some of the harmful chemicals inhaled by man accumulate in his body and cannot be removed;

Buildings and cultural monuments in direct contact with the air are destroyed more rapidly.

Epidemiological studies have confirmed a 20 percent increase in pulmonary diseases (including cancer) in Sofia compared with the national average. Particularly vulnerable are children under the age of 14.

A link has been confirmed (a correlation) between the content of arsenic in the air and anemia among students, between bronchitis and the content of sulfur dioxide, and between pneumonia and dust and sulfur dioxide, and others.

Clearly, the development and urbanization of the cities must entail changes--bigger or smaller--in the environment. It is not possible to produce the energy needed to maintain life in the city without the release of substances in the environment. However, it is possible to reduce to a certain minimum level the quantity of such admixtures.

This idea is included in the general plan of Sofia. However, it should not be considered that the concentration of harmful substances could be reduced through some kind of "optimizing" or "redistributing" of pollution sources on the territory of the city or in accordance with the direction of the predominating winds. In usual nonanticyclonic days, i.e., in days with normal atmospheric ventilation, air pollution over Sofia is hardly different from that in other cities. The days with temperature inversion--a concept we have mentioned repeatedly--are those in which a critical number of harmful admixtures accumulate in the atmosphere. This is the main problem, the weak spot of the capital's climate which must be taken into consideration.

The consequences of the way to plan, build, and operate enterprises in order not to allow air pollution to an extent harmful to man are clear. They have been discussed and considered in the future development of the city. However, two facts worthy of attention exist.

First: The incredible increase in the number of motor vehicles within city limits. This is an increase which, because of the adverse characteristics of the topography, the city is unable to absorb painlessly.

Furthermore, since reorganization and reconstruction are considered, most frequently, as a technological and a construction problem, and less as a sociohygienics problem, it would be proper to ask ourselves, "Was the widening of Lenin Boulevard sensible, resulting in 'driving' such a huge main artery straight at the heart of the city? Was it necessary for transportation to the new Mladost and Lyulin housing districts mandatorily to involve the use of buses rather than the less harmful trolley buses?"

The planned reconstruction of the Evlogi Georgiev and Klement Gotvald boulevards, and their "saturation" with an ever higher number of vehicles of all types will worsen living conditions along the boulevards. The tall buildings on both sides of this relatively narrow artery will hinder the dispersal of pollutants and noise.

Second: The conservation of liquid fuel requires a gradual return to coal. The eventual conversion to solid fuel by heating and energy sources in Sofia, unless secured in advance with filters and dust collectors, would worsen the microclimate of the city to an extent hard to predict. To begin with, the smog would become longer-lasting and more frequent as a result of inversions which will be hard to break up. At the same time, in the static inverted smog stratum the motor vehicles will release far more pollutants than 20-25 years ago. Their retention would be lengthy and their concentration will grow at a high speed.

All this will require the taking of serious measures as of now, long before the disaster has become difficult to repair.

5003

CSO: 5000

## GUATEMALA

### BRIEFS

REFORESTATION CAMPAIGN--Seven thousand seedlings were planted this morning along the outskirts as part of the national reforestation program being promoted by the government of the republic. The sowing of these small trees, which were supplied by the National Forestry Institute, was the work of more than 3,000 students from various primary and secondary schools. This program was planned by the Reforestation Commission of the Ministry of Education and the National Reforestation Committee. Gen Leonel Vassaux Martinez, coordinator of the campaign at the national level, toured the entire reforested region which covered an area from Ciudad de Plata III, zone 7, to the Herman Pedro Private Hospital, zone 11. The official said that all students, particularly those studying in schools in the zones indicated--i.e., on the outskirts--have the duty of seeing to it that the seedlings are not destroyed, as happens regularly. [Text] [Guatemala City DIARIO DE CENTRO AMERICA in Spanish 11 Aug 80 p 4] 8143

CSO: 5000

IRENA DIRECTOR CITES CONTAMINATION OF RIVERS, LAKES

Managua EL NUEVO DIARO in Spanish 13 Aug 80 pp 1, 10

[Text] The Prinzapolka River, on the Atlantic, is contaminated with cyanide, which causes the death of human beings and domestic animals, according to Comrade Jorge Jenkins, director of the Institute of Natural and Environmental Resources (IRENA), who spoke yesterday at the course on Energy, Environment and Development which began last Monday under the auspices of ALIDE (Latin American Association of Financial Institutions for Development) in Nicaragua.

Comrade Jenkins pointed out specifically that "in our country we had as a dark heritage of the Somoza regime the problem of contamination with cyanide in our rivers," making reference thereafter to the Prinzapolka, one of the biggest rivers on the Atlantic.

In his speech Jorge Jenkins also broached the problems of contamination in Lake Managua, "where 40 tons of mercury have been dumped in the past 10 years and where various types of contamination are reflected, such as the dumping of solid waste in all of the sewage that pours into it without any kind of treatment."

He pointed out that Nicaragua is suffering from environmental pollution phenomena which are not in harmony with the degree of socioeconomic development attained in the last decade in this country.

He said that the Environmental Quality Division of IRENA "is this organization's Cinderella because it is the one that has the least number of qualified technicians. The Somoza regime never bothered to send persons to study ecology or how to evaluate environmental impact and everything related to the environment, for which reason we have had to practically start from zero, while having environmental pollution problems typical of industrialized countries."

He gave assurances that dealing with these problems, despite the technical capability constraints, is one of the challenges that the revolution has imposed on itself, "and it will overcome them."

Speaking of energy and of doing away with Nicaragua's dependence on petroleum, as well as of the possibility of not using hydrocarbons, he noted that the country is developing nonconventional sources of energy, citing as an example solar energy: "We are blessed with being located in a geographical setting which makes it possible to harness large amounts of solar radiation throughout the year."

Just a short distance from the Central America School there is a large building that will be used as a hotel which will be provided with solar energy, the first project of its type in Central America.

Jenkins also gave assurances that there was a possibility of developing wind energy. "We have plains that are traditionally called windy plains where this will be feasible, and therefore explorations have been made for a pilot program for the exploitation of wind energy. Furthermore, we have considerable geothermal energy and we have the potential of our forests, with over 174 cubic meters per hectare in many areas of the north."

He also announced that about 6 months ago, with the help of the FAO, the IRENA began implementing a program involving coal--a substance that was being supplied to some of the country's industries--as part of the program to develop nonconventional sources of energy.

He concluded by saying that "despite our limitations, we do have the political will, the determination, the aspirations to carry out these programs, in spite of the enormous financial, technical and administrative constraints that we face."

9661

CSO: 5000

## ACTIVITIES ON FOREST FIRE PREVENTION DISCUSSED

### Protection of Forest Resources

Algiers EL MOUDJAHID in French 3 Aug 80 p 3

[Text] Algiers. The strong heat wave prevailing in the country for the past few days has had a direct effect on forest fires.

It has been established, in fact, that fire risks increase with higher temperatures, strong winds, and low humidity.

Such is the situation which has prevailed since the beginning of August during which the meteorological services have recorded 45°C temperatures in the northern part of the country, hot winds blowing from the south at over 60 kilometers per hour, and a humidity of under 15 percent. All these are factors which, put together, have been the basis for the main fires which have broken out since this sudden and rapid rise of temperatures from west to east.

All available means on the national level have been mobilized. However, this work is hindered by the winds, the rugged and virtually inaccessible terrain, and the unbearable heat in daytime work.

The secretary of state for the forest and reforestation has gone to Tlemcen, Sidi Bel-Abbes and Saida to inspect the development of operations on the spot and study, together with the individual wilaya authorities, the decisions to be made to strengthen fire prevention and fighting facilities.

Each fire, particularly those which have broken out in recent days, has required a mobilization of substantial manpower and material facilities. Let us emphasize in this case the involvement of officials and the dedication and loyalty of everyone, civilian or djounoud of the National People's Army, who make possible the strengthening of forest protection facilities set up, in particular, in the wilayas affected by fires in Tlemcen, Sidi Bel-Abbes, Saida, Blida, Bejara, Setif and Annaba.

Our country's forests are located in the most rugged mountain terrain. The infrastructure--tracks opened by fire and water sources--is clearly inadequate.

In order to safeguard this resource and protect it as much as possible from natural disasters such as fires, we must pursue and intensify our efforts rapidly to develop a basic infrastructure which is virtually absent in many areas. This target has been included in the five-year plan.

Meanwhile, the citizenry must display vigilance and pay attention to the prevention of any risk of fire and make itself available in order to contribute to the struggle against fires.

### Greater Vigilance In Azazga

Algiers EL MOUDJAHID in French 7 Aug 80 p 2

[Report by S. Saadadou]

[Text] This year protecting the forests from fires is a major concern for the authorities as well as the population and the concerned services.

In fact, every year the national forest resources suffer from degradation and losses caused by forest fires.

In the Azazga Daira the forest services have organized a system for fire prevention and forest protection.

The setting up of watch-towers, the strengthening of locomotion facilities and the permanent mobilization of the manpower for a closer surveillance of forests in the summer season, which is propitious to forest fires, would make it possible to protect the forests which are quite thick and widespread in this mountainous area.

Let us recall the huge fire of the summer of 1979 which, we hope, will become no more than a bad memory.

This year, with the advent of the first heats, measures were taken to struggle against forest fires, involving the use of all necessary means.

Since communications facilities from these mountain areas to the center (Azazga), aimed at informing the civil fire protection system of fire outbreaks, were ineffective, particularly from Zekri (a very distant settlement), a radio communications set was put at the disposal of the forest services, thus enabling them to communicate at all times.

Let us note in this connection that three forest fires broke out several days ago at the Bouhlalou site in the Azazga municipality within a single week. However, thanks to the local facilities, they were rapidly restricted.

Another forest fire broke out several days ago at the Rabta site (Azazga municipality), destroying several hectares of olive trees. Thanks to the rapid intervention of the civil protection system the damage was limited.

Let us note, on the other hand, that within the framework of the protection of forest resources, the population has become aware of the need to participate in such activities through surveillance on the level of the rural centers.

Such increased watchfulness notwithstanding, great caution should be displayed by vehicle drivers and campers.

#### Intervention Groups Organized in Seb Dou

Algiers EL MOUDJAHID in French 7 Aug 80 p 2

[Report by M. Gadiiri]

[Text] Oran (from our bureau). The Seb Dou Daira, located in the Tlemcen Wilaya, includes 121,248 hectares in forests and 123,500 hectares in esparto-grass. The predominant species are Aleppo pines in the east (El Gor municipality) and green oak in the west (Seb Dou-Sidi Djillali and Beni-Snous municipalities). In the south the steppe spreads over a surface of 200,000 hectares, 123,500 of which are in esparto-grass.

Only four DES brigades consisting of 27 agents are in charge of watching over and managing this resource and protecting it from spoilage.

Immediately after independence the daira benefitted from development projects within the framework of protecting the Beni-Bahdel Dam and the efforts to reduce unemployment.

This activity resulted in the making of 2,000 hectares of terraces involving deep plowing and removal of rocks, after which fruit and fodder crops were planted (Seb Dou area); 2,400 hectares were terraced and reforested (the Seb Dou and El Merkoum forests), in which tracks were laid and fire prevention trenches dug.

These operations provided substantial employment, on the one hand, and on the other, improved the soil in the Seb Dou depression through the expansion of farming in addition to the initial target of protecting the soil from erosion and the widening of the Beni-Bahdel Dam located downstream from these areas, and containing 53 million cubic meters of water.

The deficiencies noted in the past included the failure of fruit and fodder crops in the Sebdeu depression due to the lack of knowledge on the part of the peasants who were deprived of the possibility to engage in small-scale livestock breeding because of such plantations.

The activities which have been carried out starting with 1970 have been satisfactory. Their breakdown is as follows: reforestation, 6,045 hectares; protection and reclamation of the soil, 1,345.5 hectares; tracks, 212 kilometers; fire prevention trenches, 263 hectares; and forestry centers and watchtowers, 10. These activities were carried out within the framework of a special plan and in the course of the first and second four-year plans. According to the plan for the development of the El-Aricha municipality, 151 of the 220 hectares planned were reforested.

The results of this series of programs involved the opening of jobs and an increase in the rate of reforestation which has remained low in terms of the weather balance and the ecosystem.

Within that time the service was subjected to an administrative reform through the establishment of the National Forest Work Office (ONTF) which carried out the planned programs together with the forestry administration which became part of the agricultural service. Another enterprise was subsequently established in the Tlemcen Wilaya to strengthen the ONTF. It was the Forest Resources Development Enterprise (EMIFOR). A number of maintenance and management projects included within the operational and equipment budgets for 1980 are being currently implemented by the latter.

It would be impossible to assess the constraints, for this second period has remained latent in terms of most activities, even though it should have been improved through the training of proper personnel, the study of forest management, and the education of the population.

The consequences are visible, above all, in the increased number of fires which broke out in 1977 and 1978, in the course of which 8,027.5 hectares (32 fires) burned down. The most severely affected are the forests of the El-Gor and Beni-Snous municipalities. In 1979 only 14 fires were recorded, covering 345 hectares in forests. In this case a prevention plan had already been drafted and *daira* and municipal commissions covering all pertinent sectors had been set up. Overall coordination among all services was good. On a parallel basis, emergency intervention shock groups consisting of citizens provided major support in fighting last year's fires.

The forest registration and reforestation technical services were kept in a state of readiness on the spot 24 hours a day in the summer months, i.e., during the fire hazard season.

## Forest Fire Reported

Algiers EL MOUDJAHID in French 5 Aug 80 p 1

[Text] Sidi Bel-Abbes (APS). Continuing his inspection tour throughout the western part of the country, Mohamed Rouighi, secretary of state for the forest and reforestation, arrived in Sedi Bel-ABbes from Tlemcen Sunday afternoon together with his close collaborators.

The secretary of state immediately visited Ian Djoher in the Telagh Daira to acquaint himself with the situation which had recently developed as a result of a forest fire in the area.

The fire which broke out on 31 July was brought under control 3 days later with the help of substantial manpower and material facilities, in particular elements from the National Service and the neighboring population.

The fire, boosted by a violent gusty wind, was the most severe in the Sedi Bel-Abbes Wilaya, destroying a surface of about 4,500 hectares.

Before leaving the Sidi Bel-Abbes Wilaya for Saida, Mohamed Rouighi had talks with various officials in charge of the local facilities for increasing the struggle against fires.

5157

GSO: 5000

COMMENTS ON AL-SAKHNA DEVELOPMENT PROJECTS, AL-ZARQA' STREAM POLLUTION

Amman AL-DUSTUR in Arabic 18 Jul 80 p 2

[Article by Zahi Raja: "Al-Zarqa' Stream Pollution Brings Many Risks to al-Sakhna Residents; Citizen Develops Rash as a Result of Gnat Bites"]

[Text] Even though the trees still cast their shadows over the town of Al-Sakhna, and people still attend to their daily work, many things have changed in the town.

Fishermen are no longer seen at the banks of the stream, and the fish have disappeared from the waters, possibly forever. Even the frogs have not resumed their croaking. The stream has taken on a repulsive odor, and its color is no longer that of the sweet water people used to drink. In place of the small fish and the water's sparkle, something new has appeared: armies of flying insects--mosquitos, gnats, and so on.

Thus, the town of Al-Sakhna has begun to endure a new condition, a health condition which requires treatment. Since the town is concerned first of all with treating this condition, AL-DUSTUR had to have a meeting with the town officials to inquire about the truth of the problem.

In Al-Sakhna

Mr Muhammad 'Adil, Mayor of Al-Sakhna, said: "It is not incorrect to say that the stream's contamination has cast a gloomy atmosphere over all people in the surrounding area. Since the stream is not deep, small holes on both sides have been transformed into stagnant pools infested with insects of various types, especially the biting types. In the evening hours, there are swarms of bugs like flocks of birds."

He added: "As for us, we do not possess the means to combat them, except for spraying the area. We have used equipment belonging to the town of Al-Zarqa', but the operation was not effective, due to the poor condition in the stream. One of the duties of the Public Safety Committee is to spray the entire area of the stream from helicopters, with the hope of reducing the severity of the problem."

He said that the causes of the problem will not be eliminated until the factories are dealt with.

One of the townsmen in Al-Sakhna was investigating an irrigation ditch for us and was covered with a rash because of the bites. He assured us that he sleeps at night wearing socks and protective cover. He also assured us that the spray would never solve the problem."

We asked one of the farmers near the stream about the impact of the water contamination on his crops. He said: "The stream's water is contaminated. We are irrigating our farms with this water which is turning red, blue, or yellow. The causes of the stream's contamination are known, of course, and the only casualty is ourselves." He said that the water contamination has a big effect on the crops and livestock, especially vegetables which are eaten raw. As for the livestock, they are constantly exposed to diseases.

#### Governor of al-Zarqa' Governorate

The following statement about the Al-Zarqa' stream problem came from Mr Salim al-Qadah, governor of the Al-Zarqa' governorate and head of its Public Safety Committee:

"Several meetings have been held to study the situation and determine its causes in order to devise a solution. Originally the municipalities of al-Rasifah, al-Zarqa' and al-Sakhna set about deepening the stream's course so that the water would flow fast enough to eliminate the stagnant pools on both sides. We also formed a committee to keep track of damage to crops which are eaten without cooking. Also, the ministry of health has demanded that the area be sprayed by helicopters to combat the insects and mosquitos. We are still waiting for approval from the competent authorities for the spraying operation.

"We shall also request owners of the factories built on the stream's banks to construct purification plants."

He said that the agriculture department is organizing a campaign to advise the farmers to plant types of vegetables other than those which they are accustomed to growing.

As for the needs of al-Sakhna, the town's mayor Mr Muhammad 'Adil said: "We have requested and are still requesting that a road be built to connect Al-Sakhna with Jarash, and another road to connect al-Sakhna with al-Hashimiyah, which is no more than 5 km from Al-Sakhna." He said that constructing these two roads will have an effective impact on the town's growth and development.

He added that the road which connects al-Sakhna to al-Zarqa' is very winding, and, therefore, risky. Also, the road has not been paved as requested. He said that the municipality submitted a request to construct an industrial zone in the town to create industries which would help the town grow and flourish.

He said that there is serious study to construct a sewage system for the area of al-Rasifah, Shanlar and al-Zarqa', and a purification plant as drafted in the plans.

Concerning the accomplishments and projects of al-Sakhna, which was founded in 1969, the municipal secretary, Mr Ahmad 'Abdal-Wadud said: "An integrated water system has been established in the town and the camp, in addition to school buildings. A loan of 18,000 dinars has been obtained to build a new wing, industrial or scientific, for the male school. We have implemented a good organized system of streets at least twelve meters wide in the town. We have built an office complex which includes the post office, the health clinic and town hall. Its cost amounted to 20,000 dinars." He said that the town dug an artesian well 60 meters deep to obtain drinking water, but was not successful in drawing water. Thus, it has been buying water for a long time at a cost of sixty fils per [cubic] meter in order to protect the well-being of the townspeople. He said that the Drinking Water Agency will be providing Al-Sakhna with water regularly.

Concerning future town streets, the municipal secretary said that the town will implement a number of vital projects in the city, such as widening the main street, clearing and paving new streets and building parking lots. Sidewalks will also be laid, the first floor of an office complex will be built, and a public library will be founded.

9605

CSO: 5000

ENVIRONMENTAL PROTECTION PLANNING DETAILED

Dubay AL-BAYAN in Arabic 23 Jul 80 p 4

[Text] The High Level Committee on the Environment headed by al-Sayyid Hamad 'Abd al-Rahman al-Madfa', minister of health, will convene immediately after the 'Id al-Fitr holiday. It will discuss the issue of basic procedures of the committee, and the drawing up of rules and regulations and procedural methods that will secure the integrity of the environment. A memorandum has to be drafted in connection with this issue. It will be presented to the cabinet for approval and for whatever appropriate decision is required.

The above mentioned committee was formed as a result of a decision made by the cabinet. Its mandatory powers and some of its areas of concern were specified. It is to be headed by the minister of health and to include the membership of a high official concerned with the environment in each of the following ministries: ministry of planning, of petroleum and mineral resources, of health, of agriculture and fisheries, of education, of finance and industry, of public works and housing, of electricity and water, of information, of communications and of labor and social affairs. The committee is also to include secretaries general of the municipalities, and two members from the Emirates University.

The committee is especially concerned with the following:

--The drawing up of rules and regulations and procedural methods that will secure the integrity of the environment.

--The researching and studying of plans and general policies pertaining to the environment. These should be done at the national level for the purpose of realizing the highest standards in safeguarding the environment.

--The study and discussion of plans and policies pursued by other ministries or any other committees or institutions concerned with the environment. This will also include the study of projects and programs that have been acted upon by these bodies, so as to ascertain to what extent the projects have achieved their objectives; also, what solutions were offered to overcome problems or obstacles encountered in the process.

--To coordinate between ministries, associations and organizations that have anything to do with the environment, be it at the national, regional or international level. This will enable their projects to be steered in the direction of their needs. This will also facilitate cooperation which will safeguard the environment for the coming generations. It will regulate developers according to existing environmental factors, and it will safeguard the execution of national policies for the protection of the environment.

--The undertaking, supervision, or the putting into effect of comprehensive studies and investigations on pollution. These studies should take into account the various sectors of production and resources, and the circumstances under which the level of health protection and cure could be improved. The studies should also include observations on pollution and its effects on health and the environment and the taking of all necessary protective and remedial measures to control environmental pollution.

--To work for greater attention to the cultural, informational, social and educational aspects that have to do with the environment and its protection. This would enable the citizens, of various backgrounds, to take active part in the realization of these objectives. This is particularly true as regards air, water and soil pollution, and the protection of natural resources in the country so that these are not badly exploited.

--The study of the effects of family planning and overpopulation on the environment.

--To work for the protection of the national heritage in all its forms, particularly the cultural and the architectural, and to enhance awareness of the national heritage at all levels, at home and abroad.

--To establish procedures for the compiling of bulletins and information and for their useful exchange, particularly among research institutions in the Gulf, the Arabian Peninsula, the Arab world and other foreign countries, and among regional and international organizations specializing in any aspect of the environment.

--The studying and the proposing of special funds to meet expenses incurred in the execution of projects on the environment. This would include the establishing of incentives, and the financial backing of environmental projects.

--The drawing up of the annual budget of the committee.

--The researching, studying and proposing of solutions for any problems concerning the environment, which the cabinet or any other official body in the country refers to the committee.

--To lay foundations for the linking of environmental considerations to planning and developmental policies on the national level. This will be

effected by the incorporation of environmental provisions as part and parcel of developmental policies, planned and executed by government or private sectors. Also, to contribute to the national development effort whatever technology is needed, and to propose ways of benefiting from technological progress and searching for substitute products, in particular those that are rare in this country. Also, to estimate the effects of particular projects on selected locations and to propose environmentally more appropriate locations.

--To execute plans and projects which will help train persons to acquire skills needed in the field of the environment.

--To check or control all projects, national or private, which adversely affect the quality of the environment. The committee may, when necessary, spell out a condition, prior to the inception of any project, that it must study and explore its possible effects on the environment. To realize this objective, the committee may have the assistance of all ministries, institutions and organizations whether national, regional or international. For this purpose, the committee may use legal, financial, political, educational or any other necessary means.

--To act on studies made which have to do with air and sea pollution; to protect the waters particularly in the Arabian Gulf and in the Oman Gulf from pollution; also to protect the natural living resources in the two gulfs.

--To study the soil, the water, the minerals, and means of energy and to propose ways of protecting these from deterioration or from ill-use; to set up procedures that will aid better utilization; to study the desert and the semi-desert areas and to strive to limit the phenomenon of wasteland in the country.

--To propose protective measures regarding the use of exterminators, having first observed their effects, immediate or otherwise, and to find more up-to-date ways of using these.

--To establish the proper means for forecasting possible natural disasters, so as to limit their destructiveness.

--To completely isolate problems relating to human settlement in the city, in the village and in nomad areas; to observe the effects of economic and social betterment on settled groups of people; to propose solutions to problems and to put these to practice. This includes the following:

--To reach an ideal distribution of residents in towns as well as in the country.

--To assure the use of appropriate technology in building and construction works, and to see that materials used are appropriate to the environment and to the materiel heritage of the country.

--Town and village planning should consider the most appropriate conditions for living purposes.

--To assure the functioning of means of transportation in a manner commensurate with the advance made in building and living standards, and to realize the lowest amount of air and noise pollution.

9378

CSO: 5000

## CAPE VERDE

### BRIEFS

REFORESTATION CAMPAIGN UNDERWAY--A national campaign for the planting of 1.3 million trees is going to be officially launched by the prime minister of the sister republic of Cape Verde, Comrade Brigade Commander Pedro Pires, according to an ANOP report published in the Portuguese newspaper DIARIO DE LISBOA. The third national reforestation campaign of the nine inhabited islands of the Cape Verde Archipelago, is going to begin after the first rains which fell in recent days on the islands of Santo Antao, Santo Vicente, Santo Nicolau, Boavista, Santiago and Pogo. Acacias, pine trees, eucalyptus and many other types were prepared in tens of nurseries throughout the country and they are ready to root themselves in the ground. A total of 650,000 trees were planted in Cape Verde in 1978 in a national campaign in which the majority of officials, military personnel and the people participated. A million trees were planted in 1979, Ministry of Rural Development technicians estimating that 95 percent survived. [Text] [Praia VOZ DI POVO in Portuguese 9 Aug 80 p 3] 8908

REFORESTATION CAMPAIGN APPEALS FOR ASSISTANCE

Bissau NO PINTCHA in Portuguese 21 Aug 80 p 1

[Text] The office of the Commissioner of Natural Resources, through the Department of Forestry Services, began a nation-wide campaign of reforestation aimed at counteracting the wave of burnings which have taken place and the uncontrolled felling of trees for commercial purposes. Therefore, the Forestry Services in a communique issued on the subject, express their inability to assume the complete execution of the operation and for that reason issued an urgent appeal to all the commissions and other agencies with infrastructures and services in the interior of the country to provide the maximum support to the reforestation campaign. A nursery was created in Embunhe, Bissora Sector, for this first phase. It has a capacity of one million seedlings. However, this figure was not reached because of the delay in the installation of a water pump. There are nearly 200,000 seedlings of 16 local and foreign varieties available for this campaign. The land and places for reforestation are already prepared in the regions of Oio, Bafata, Cacheu and Gaue, a total area of 200 hectares.

This reforestation campaign already underway, whose work in the preparation of nurseries began months ago, has the long term objective, in addition to opening specialized public service stations, of safeguarding ecological balance in national territory because of the need man has to use the various forms and amounts of the great wealth of forestry resources.

The Department of Forestry Services, as a specialized institution, naturally assumes the control of the campaign, also providing all the technical support necessary. With respect to support required, it can be mainly in labor, means of transportation, and materials for preparation of land and planting operations. The campaign also requires the necessary support of every citizen.

B908

CSO: 3000

## POLLUTION CONTROL EQUIPMENT SURVEY PUBLISHED

Athens BUSINESS & FINANCE in English 30 Aug 80 pp 8-10

[Text] Until about 1975, the Greek market for air and water pollution control equipment was fairly limited, largely as a result of the absence of pollution control policies and the lack of intensely industrialised areas, compared to other European countries. However, over the last five years, there has been considerable development and expansion of the market, with the implementation of the government policy to force polluting industries to observe the existing legislation on pollution control.

Amongst other factors that have led to the further expansion of the market, is Greece's forthcoming accession to the EC in January 1981. There have been intensive efforts to industrialise in preparation for this and this has been accompanied by a need to align pollution control regulations in Greece with those in other European countries, and according to EC regulations. Clearly, this has considerably increased the demand for pollution control equipment. Also, there is an ever-increasing growth of environmental consciousness in Greece, particularly in the heavily industrialised areas of Athens-Piraeus and the coasts of the Saronic and Thermaikos Gulf. New and stricter legislation has been introduced, and the total expenditure for the period from 1977 to 1980 on pollution control equipment has amounted to approximately 2.5 billion drachmas.

#### The development of the market

Since 1975, the authorities have increasingly brought pressure to bear on industries to reduce their air and water pollution levels. Over the period since 1975, the market has expanded at great speed, which can be put down to the low initial volume of the market, especially in equipment for the control of water pollution. The market has of course been affected by legislation concerning pollution control. Firm government support for the efforts to reduce pollution levels includes the financing of studies

for wastewater treatment programmes, and assistance to private industry investments in pollution control equipment. Under Law 849/21.12.1978, industrial investments made between January 1978 and December 1985 for the purpose of reducing environmental pollution are subsidised by interest-free loans of up to 50% of the total investment. Since the law was passed, 500 million drachmas have been spent in this way.

#### The size of the market

There is a lack of official statistical data on the total size of the Greek market, but according to the Ministry of Industry and Energy over the period from 1977 to 1980, expenditure on pollution control equipment by the most heavily polluting industries was as follows:

Aluminium	1 billion drs.
Cement	600 million drs.
Steel	150 million drs.
Textiles	100 million drs.
Chemicals and fertilisers	250 million drs.
Metallurgical	500 million drs.

There are as yet no figures for the expenditure of the oil industry in the Thassos area. The main market for pollution control is therefore to be found in the private sector. In the public sector, the market is chiefly in the field of electric power production, and also in laboratories, organisations, and institutions that are concerned with pollution control. However, the number of plants for the treatment of wastewater is expected to increase rapidly under government sponsorship, and there should be considerable development and expansion of the market in this field.

The lack of adequate provisions for the treatment of domestic wastewater has led to serious pollution problems in many areas, particularly in the heavily populated Athens-Piraeus district. In 1978, the Greek government commissioned a preliminary study on the disposal of wastewater in the Attica Basin, by a British firm of Consulting Engineers. The study proposed that facilities be set up in the Greater Athens areas for primary sedimentation, sludge separation, the treatment of sludge, and the treatment of toxic or oily wastes.

TABLE 1 (Source: ICAP 1980)

Domestic suppliers	Total assets	Fixed assets	Net worth	Gross income	Net income
					(1978)
<b>TEMEK SA</b>					
Manufacture and installation of industrial equipment. Specialise in air purification (mechanical collectors and wet scrubbers).	115,425	34,274	27,821	36,216	4,161
<b>SERACO LTD</b>					(1978)
Design and manufacture sewage purification equipment (rotary drums and surface aerators).	2,929	244	200	2,191	970
<b>MASSINA S. CHRYSSOLOURIS S.A.</b>					(1978)
Manufacture a wide range of industrial equipment.	81,753	35,834	25,188	6,741	2,011
<b>KSB VIOSEN PUMPS INDUSTRY S.A.</b>					(1978)
Manufacture of water pumps designed for use with waste water.	29,621	28,487	15,605	4,911	1,653

Note: 1. Financial data is given in units of 1,000 drachmas.

2. There are other minor firms on the market.

The proposals of the survey were accepted, and plans for their implementation are under discussion. Domestic wastewater treatment therefore is expected to be a major market for water pollution control equipment by the mid-1980's.

The market is based almost totally on imports, which are mainly from other European countries, particularly West Germany, and Sweden. Domestic production is limited chiefly to fairly simple equipment of a general application. It should be added here that although there are only a few Greek firms that produce pollution control equipment as their main line of activity, (see Table 1) there are those that produce necessary component parts of the equipment in the production of general industrial equipment. Limited domestic production of pollution control equipment can be attributed to the highly advanced technology involved in the manufacture, the wide variety of equipment available from other European countries, and the relatively small Greek market that there has hitherto been. It should be noted however, that between 40 and 50% of the construction of pollution control systems and installations is Greek.

#### **Equipment and processes currently in use in Greece**

##### *a. Water*

The primary treatment of wastewater, the first stage in the treatment of a polluted water-stream, is the commonest process used in Greece, and involves filtration and sedimentation. Screens, drums, pipes, and centrifugal separators are used in this process. Secondary equipment, involving biological oxidation, is also carried out in Greece under the "activated sludge process". Dosing systems, surface aerators, diffusion equipment, scrapers, pumps, chlorination equipment, trickling filters, and instruments are used. Package systems, designed to meet the needs of a particular plant are increasing in their usage, and are expected to continue to do so, as they are generally preferred by the larger plants, and the number of larger plants is increasing. The market for instrumentation is also increasing, as legislation passed in 1979 has stated that industries with effluents must analyse them regularly, and submit their findings to the authorities when asked

to do so. Continuous recording instruments must also be installed by heavily polluting industries. With the further development of the oil and ship building industries, the market for oil skimming equipment, and oil separation systems is expected to increase.

#### *b. Air*

Fabric filters, currently in use in the metallurgy, cement, and fertiliser industries will continue to have a market both in already established plants where facilities will need to be completed and renewed, and in new plants. Electrostatic precipitators are in use in the electric power industry, the metallurgical industry, and the cement industry, and in future will be required only when new units are built, or the existing ones expanded. The power industry is expected to be the most important outlet for these in the near future. The market for mechanical collectors is expected to expand rapidly, as is that for wet scrubbers, supplied domestically, and used in the mining, metallurgical, and pharmaceutical industries.

#### **Supplying the equipment**

Generally, the equipment is supplied through agents, who are either representatives on commission, or importers. Suppliers of package systems generally use representatives, while contracting-engineering firms use importers. These firms usually import the equipment required, and then sell to the customer the complete installation, at a price that includes labour costs, etc. Competition is very keen, and reliable systems with low energy consumption and maintenance requirements are preferred. An after sales service is important.

#### **Import controls and requirements**

Because the pieces of equipment that go to make up a pollution control system are so varied, imported equipment is not classified under separate headings, by the Ministry of Finance in its Tariff Code, but is included in groups that include other kinds of industrial equipment. The tariff category 84.10 B 2.b, for example, includes pumps, 84.11 A 3.b includes air compressors, filtering equipment is under 84.18 G 2, mixing equipment under 84.56 B, centrifugal separators under 84.18 G 1 b, analysing instruments under 90.28, and other machinery and systems not classified elsewhere under 84.59 E 2.

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*Lee*